Optical opportunities

FRENCH COMPANY MEMSCAP HAS WON THIS YEAR'S EUROPEAN SEMICONDUCTOR/WACKER SILTRONIC AWARD FOR BEST EUROPEAN START-UP. THE WINNING FIRM SUPPLIES THE WIRELESS AND OPTICAL COMMUNICATIONS INDUSTRIES WITH SOLUTIONS BASED ON MICRO-ELECTRO-MECHANICAL SYSTEMS (MEMS) OR MICROSYSTEMS. DR MIKE COOKE REPORTS ON THE RECENT DEVELOPMENTS AT THE COMPANY THAT CLINCHED THE AWARD

Dr Mike Cooke presenting the award to MEMSCAP president and CEO Dr Jean-Michel Karam

From being an obscure and largely R&D-oriented offshoot of silicon chip processing with just a few applications (accelerometers for airbags in cars, microphones), microsystems or MEMS (micro-electro-mechanical-systems) are positioning themselves at the heart of optical communication component production. The French-based company MEMSCAP - launched by France's TIMA information and microelectronics technology laboratory in 1997 - has been key to this development and also reflects the change. The company provides MEMS-based solutions for communications in the shape of components, intellectual property, computer aided design tools and related services.

The recent establishment of MEMSCAP Oy - a wholly-owned subsidiary in Finland - will focus efforts on active optical components for the metropolitan and access layers of the optical network. The new company will have a licensing and development relationship with Finland's Optoelectronics Research Centre (ORC). Among MEMSCAP's aims is to source components optimised for the new low-cost plastic optical fibre (POF) market. Available products include RC-LEDs operating at 650nm and VCSELs operating at 690nm.

RC-LEDs: coming soon to the Bernin fab

ORC has licensed RC-LED (resonant cavity light emitting diode) and VCSEL (vertical cavity surface emitting lasers) technology to MEMSCAP, which intends to ramp up additional internal capacity at a new fab in Bernin, near Grenoble, for high-volume production over the course of the next 18 months.

"MEMSCAP's RC-LEDs in particular offer several advantages for short-haul polymethyl methacrylate (PMMA) POF transmission," says Mihail Dumitrescu, director, active optical components, MEMSCAP Oy. "These benefits include operation at the fibre's attenuation minimum, flexibility in alignment, a 30% coupling efficiency without any supplementary optics . . . These RC-LEDs have a high efficiency at 9.5% and hold the world record in speed for red wavelength range spontaneous emitters, achieving error-free transmission rates beyond 622Mbps."

Further work in the optical arena is represented by ADC, which made a co-development agreement and production agreement with MEMSCAP last year. ADC introduced an optical switch component based on MEMS at this year's SUPERCOMM 2001 exhibition at Atlanta GA in June. MEMSCAP also develops

variable optical attenuators (VOAs) and filters for ADC.

RF components

Another MEMSCAP initiative is a partnership with Taiwanese company Walsin Lihwa. The companies have made a ten-year, multimillion-dollar agreement for producing wireless devices. The aim is to offer wireless designers a full concept-to-manufacture chain for low-cost MEMS-based RF components.

Walsin will license MEMSCAP's RF MEMS component designs, manufacturing know-how and MEMS design software enabling Walsin to offer fabrication of RF components, including inductors, switches and variable capacitors. Walsin will be using MEMSCAP's patented Above-IC technology and membrane core technology.

Platform

To push its capabilities into the electronic design automation (EDA) mainstream, MEMSCAP's MEMS Xplorer has been integrated with the system-on-a-chip (SOC) tool flow at Cadence Design Systems.

Within the Cadence design environment, users will be able to move from schematic capture to automated generation of component layout, select from MEMS primitives, view cross sections and simulate etching. The MEMSCAP Technology Manager software allows users to target designs to a number of technology processes and foundries. The aim of this move and others like it by MEMSCAP has been to enable system designers who are not necessarily MEMS experts to use the technology.

Winning start-up

"The success of MEMSCAP is indicative of the European industry," said David Ridsdale, editor for European Semiconductor, when the European Semiconductor/Wacker Siltronic European Start-up Award was announced. "Their products are representative of new and existing markets in which Europe leads the world."

"As an emerging technology company, MEMSCAP has worked hard to demonstrate that MEMS are a proven and viable technology for the communications markets," says Jean-Michel Karam, president and CEO, MEMSCAP. "Receiving the European Semiconductor/Wacker Siltronics award is a gratifying validation of our work, and on behalf of all our staff I would like to thank the publication for its recognition."

In February, MEMSCAP completed a successful initial public offering (IPO) - at a time when such floatations were and continue to be generally shunned by investors. MEMSCAP's IPO success was a major factor in the award. Further market recognition came with MEMSCAP being included in the Next 150 EURONEXT Index by the EURONEXT European stock exchange organisation. MEMSCAP has been listed on France's Nouveau Marché since March 2. The EURONEXT 100 and Next 150 indices include companies with the strongest market capitalisations listed on the Amsterdam, Brussels and Paris stock exchanges.

The Optoelectronics Research Centre (ORC) in Finland

The award, now in its second year, was announced in Edinburgh at the JEMI UK Semiconductor 2001 conference and trade exhibition. Last year's winner was Si Automation (see below). Candidates for the award must have been running for less than five years. MEMSCAP was picked from a number of nominees from around Europe.

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